

Titanium Loop Heat Pipes for Space Nuclear Radiators, Phase I

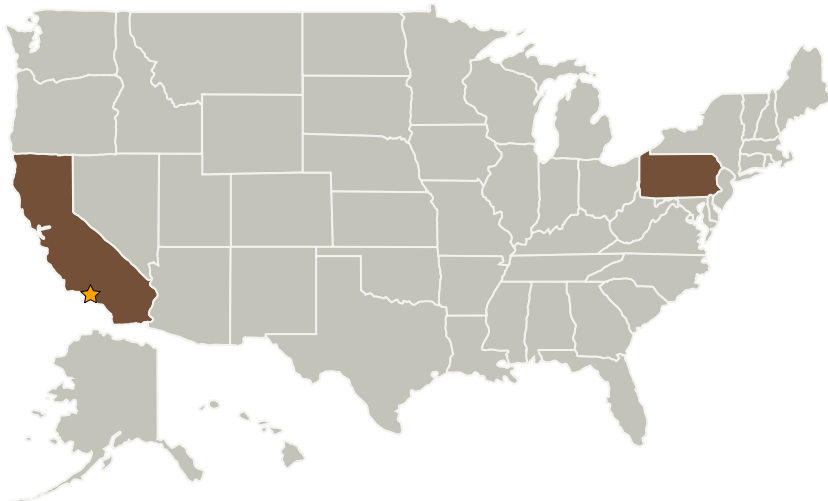
Completed Technology Project (2006 - 2006)



Project Introduction

This Small Business Innovation Research Phase I project will develop titanium Loop Heat Pipes (LHPs) that can be used in low-mass space nuclear radiators, such as the radiators currently being designed for Project Prometheus, as well as radiators for the lunar and Mars surfaces. LHPs are two phase heat transfer devices that can be embedded in radiator panels. Advanced Cooling Technologies, Inc. (ACT) has completed a radiator trade study that showed that radiators with titanium LHPs have the highest specific power in the temperature range from 300 to 550 K, increasing the specific power over heat pipe radiators by more than 1/3. The Phase I program will develop titanium/water LHPs that can operate in the low to intermediate temperature range (300 to 500K), as well as the lower portion of the intermediate temperature range (450 to 550 K). The Phase II program will develop alkali metal LHPs that can operate in the intermediate to high temperature ranges (700 to 1000 K and higher).

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Advanced Cooling Technologies, Inc.	Supporting Organization	Industry	Lancaster, Pennsylvania



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Pennsylvania

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.3 Heat Rejection and Storage